

reservoirs are formed) for reflecting the excited light from the lens 77 toward the bottom of the chip 1. The dichroic mirror 79 to be employed has such a wavelength characteristic that reflects an excited light but transmits a fluorescent light from the side of the chip 1.

On the side of the dichroic mirror 79 opposite to the chip 1 is provided a spectroscopic filter 81. The spectroscopic filter 81 transmits only such a light component that has a predetermined wavelength of the fluorescent light from the chip 1 which has passed through the dichroic mirror 79. The specifications of the dichroic mirror 79 and the spectroscopic filter 81 are determined by a fluorescent material used for labeling the specimen and a wavelength of the excited light oscillated by the laser device 71.

Along an optical path for the fluorescent light which has passed through the spectroscopic filter 81 is provided a lens 83 for focusing, for image formation, the fluorescent light on a light receiving surface of the CCD 85.

To the CCD 85 is connected a CPU (Central Processing Unit) 87 for controlling operations thereof and processing a detection signal of the CCD 85.

The movable reflection mirror 75, the dichroic mirror 79, the spectroscopic filter 81, the lens 83, and the CCD 85 make up a specimen-injection monitor optical system 89. The monitor optical system 89 detects a fluorescent label along the specimen-introducing passage 11 and the separation passage 13 of the chip 1 to thereby detect a specimen distribution at these passages 11 and 13.

In the monitor optical system 89, the lens 77 may be omitted in case that the diameter of the output light of the beam expander 73 and the design of the passages of the chip 1 as far as an excited light can be at least applied to the intersection between these specimen-introducing passage 11 and separation passage 13.

The laser device 71, the beam expander 73, the CPU 87, and the monitor optical system 89 make up the specimen-injection monitor mechanism.

A reflection mirror 91 is provided along an optical path for an excited light from the beam expander 73 when the movable reflection mirror 75 is at a position indicated by the broken line. Along an optical path for the excited light reflected by the reflection mirror 91 is provided a dichroic mirror 93 which is arranged on the

surface side of the chip 1 (in which the reservoirs are formed) for reflecting the excited light from the reflection mirror 91 toward that surface of the chip 1. The dichroic mirror 93 to be employed has such a wavelength characteristic that reflects an excited light and transmits a fluorescent light from the side of the chip 1.

Along an optical path for the excited light reflected by the dichroic mirror 93 is provided an objective lens 95 for converging the excited light in a detected position along the separation passage 13 of the chip 1.

On the side of the dichroic mirror 93 opposite to the objective lens 95 is provided a spectroscopic element 97. The spectroscopic element 97 separates a fluorescent light from the chip 1 which has passed through the objective lens 95 and the dichroic mirror 93. The spectroscopic element 97 employed may be, for example, a combination of a spectroscopic filter panel and a wedge prism or a transmission type grating.

Along an optical path for the fluorescent light which has passed through the spectroscopic element 97 is provided a lens 99 for focusing, for image formation, that fluorescent light on a light receiving surface of a CCD 101.

To the CCD 101 is connected a CPU 103 for controlling operations thereof and processing a detection signal thereof.

The reflection mirror 91, the dichroic mirror 93, the objective lens 95, the spectroscopic element 97, the lens 99, and the CCD 101 make up a separation-peak detecting optical system 105. The detecting optical system 105 detects specimens separated when a fluorescent label is detected at a detected position along the separation passage 13 of the chip 1. By separating a light from the detected position using the spectroscopic element 97, a plurality of kinds of fluorescent wavelength can be detected.

The laser device 71, the beam expander 73, the CPU 103, and the detecting optical system 105 make up the detecting mechanism.

On the surface side of the chip 1 is provided an electrode 107 for each of the reservoirs 15a, 15c, 15s, and 15w of the chip 1 for applying a voltage on a liquid contained in these reservoirs. Each electrode 107 is connected to a high-voltage supplying part 109 for supplying a high voltage to the electrode 107.

The high-voltage supplying part 109 is connected to the CPU 87, which controls its operations.

The electrode 107 and the high-voltage supplying part 109 make up a voltage-supplying mechanism, while the CPU 87 implements a control part.

5 FIG. 6 is a flowchart for showing the operations of this embodiment. FIG. 7 is a conceptual plan view for showing one passage of the chip 1 as well as a conceptual expanded diagram for showing an intersection between a specimen-injection passage and a separation passage when a specimen is introduced. The operations of this embodiment shall be described below with
10 reference to FIGS. 5-7.

An electrophoretic medium is injected into the specimen-injection passage 11 and the separation passage 13, a buffer liquid is injected into the reservoirs 15a, 15c, and 15w, and a specimen is injected into the reservoir 15s to then mount the chip 1 thus filled with these on the chip-holding station (step S1).

15 An electrode 107 is put forward into the reservoirs 15a, 15c, 15s, and 15w to cause a high-voltage supplying part 109 to apply through the electrode 107 a specimen introducing voltage on these reservoirs 15a, 15c, 15s, and 15w under the pre-discussed injection condition (step S2). Then, the specimen thus injected in the reservoir 15s starts to spread in the specimen-introducing passage 11.

20 The monitor optical system 89 is used to monitor a specimen distribution in the specimen-introducing passage 11 (step S3).

The operations shall be described as follows: Firstly, the movable reflection mirror 75 is moved to the solid line position to cause the laser device 71 to oscillate an excited light. The excited light from the laser device 71 is collimated
25 by the beam expander 73. The excited light thus collimated is reflected by the movable reflection mirror 75 and made incident to the monitor optical system 89. The excited light from the movable reflection mirror 75 is expanded by the lens 77 and then reflected by the dichroic mirror 79 to be applied to the back side surface of the chip 1. Thus, the excited light is applied all over to the specimen-introducing
30 passage 11 and to the separation passage 13.

The spectroscopic filter 81 transmits toward the lens 83 only a fluorescent-light component with a predetermined wavelength of a fluorescent